November 13, 2013

Via Electronic Filing
Marlene H. Dortch, Secretary
Federal Communications Commission
445 Twelfth Street, SW
Washington, DC 20554

Re: *Written ex parte presentation, GN Docket 12-268; WT Docket 12-269*

Dear Ms. Dortch:

Mobile Future respectfully submits to the Commission the attached paper, "FCC Spectrum Auctions and Secondary Market Policies: An Assessment of the Distribution of Spectrum Resources Under the Spectrum Screen." The analysis shows that under the Commission's case-by-case approach to the review of spectrum holdings, spectrum resources have flowed to all four nationwide carriers, as well as regional operators and small businesses.

Specifically, under the open eligibility standards in use since the introduction of the spectrum screen approach ten years ago, operators of all sizes have successfully obtained spectrum via participation in auctions and secondary market transactions. Indeed, despite assertions made by certain commercial interests seeking to have the FCC limit auction eligibility of some competitors, the paper finds that the full and open participation by all bidders in the FCC's spectrum auctions and secondary markets advances the interests of consumers and innovators.

Mobile Future asks the Commission to move forward with auction policies consistent with this record of success and the statutory objectives in the Act so the millions of U.S. wireless consumers will continue to enjoy all the benefits mobile technology can offer. In doing so, the FCC should conclude that its current case-by-case review of spectrum aggregation is the most effective path to meeting the spectrum needs of our competitive wireless marketplace.

Pursuant to Section 1.1206 of the Commission's rules, a copy of this letter is being filed via ECFS with your office. Please do not hesitate to contact the undersigned with any questions.

Respectfully submitted,

/s/ Jonathan Spalter

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Attachment

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FCC Spectrum Auctions and Secondary Markets Policies:

An Assessment of the Distribution of Spectrum Resources Under the Spectrum Screen

November 2013

MOBILE FUTURE

EXECUTIVE SUMMARY

Wireless use in the United States continues to grow at an unprecedented rate, sparking innovation and economic growth as companies invest tens of billions of dollars each year to deploy advanced networks to meet rising demand for consumers and the U.S. economy. This investment, in turn, sparks even more mobile innovation, as well as increases demand for strong, reliable and state-of-the-art wireless connectivity.

Spectrum, of course, is one of the crucial elements that enable our dynamic wireless market to thrive. As the Federal Communications Commission ("FCC"), along with the Administration and Congress, work to allocate more spectrum for wireless broadband, it is important that it not risk in doing so undermining the policies that have made the United States the leading wireless broadband market in the world. In this paper, we conclude that the FCC's decade-long approach to two policies – open auction eligibility and case-by-case review of spectrum aggregation – have proven to be among the more successful policy frameworks upon which the spectrum requirements of the diverse range of wireless competitors in the United States are being consistently addresses, and should carefully be safeguarded in the future.

Ten years ago, the FCC transitioned away from a strict spectrum cap to case-by-case review of potential new spectrum holdings, examining such factors as the state of competition in specific geographic markets and whether the proposed spectrum aggregation would increase the likelihood or ability of an entity to behave in an anticompetitive manner. This shift reflected growing agreement that a market-driven approach would create the most efficient path to accelerating the nation's mobile innovation economy while at the same time best meeting the needs of American consumers and communities.

This paper analyzes the impact of the FCC's case-by-case analysis of proposed spectrum holdings on the distribution of spectrum resources through auctions and secondary market transactions over the past decade. In brief, our analysis shows that under open eligibility and the spectrum screen approach used since January 2003 spectrum resources have flowed effectively to all four nationwide operators (AT&T, Sprint, T-Mobile and Verizon Wireless), to non-nationwide operators, and to small and very small businesses eligible for bidding preferences.

As the FCC moves forward with efforts to auction additional spectrum, it is considering whether new rules and restrictions should be applied to proposed mobile spectrum holdings. Changes to its current approach could have a significantly negative impact on the success of upcoming spectrum auctions, as well as what is today a vibrant secondary market for commercial spectrum transactions. Such changes could impose both market, operational and economic risks as well as impose a raft of unintended consequences that would ill-serve wireless competitiveness in the U.S. as well as our nation's mobile consumers who expect and deserve reliable and resilient service from their wireless service providers.

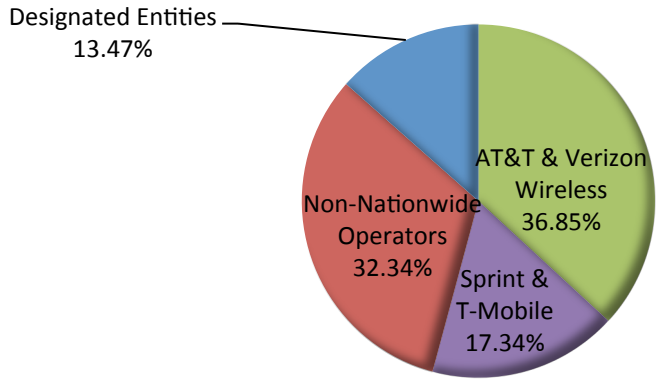
Key Findings -- Spectrum Auctions:

- Open bidding encourages participation and results in broad distribution of licenses.
    - In all nine auctions offering spectrum for terrestrial mobile broadband services conducted over the past 10 years, non-nationwide operators and small businesses have won nearly half (46%) of the aggregate MHz/POPs.[1]

    - In the 2006 Advanced Wireless Service ("AWS") auction, the one spectrum auction conducted during the past 10 years in which all four nationwide operators participated (either directly, through wholly-owned or controlled subsidiaries or via minority investments),[2] T-Mobile acquired more spectrum (26% of all MHz/POPs acquired) than AT&T and Verizon Wireless combined (25%).

    - Only two of the four nationwide operators applied and then elected to participate in Auction 73 for 700 MHz Band licenses in 2008, and only one (Sprint, through its investment in Clearwire) in Auction 86 for Broadband Radio Service ("BRS") licenses in 2009. Company decisions to participate in those auctions were based on individual business plans, network technologies, subscriber penetration rates, usage patterns, characteristics of the individual bands available for auction, and other considerations. As a result, the distribution of spectrum from these two auctions differs from others conducted during the 2003-2013 timeframe, although in both instances a significant number of smaller operators participated and won spectrum.

The following pie chart reflects the distribution of spectrum in these auctions conducted between 2003-2013:[3]



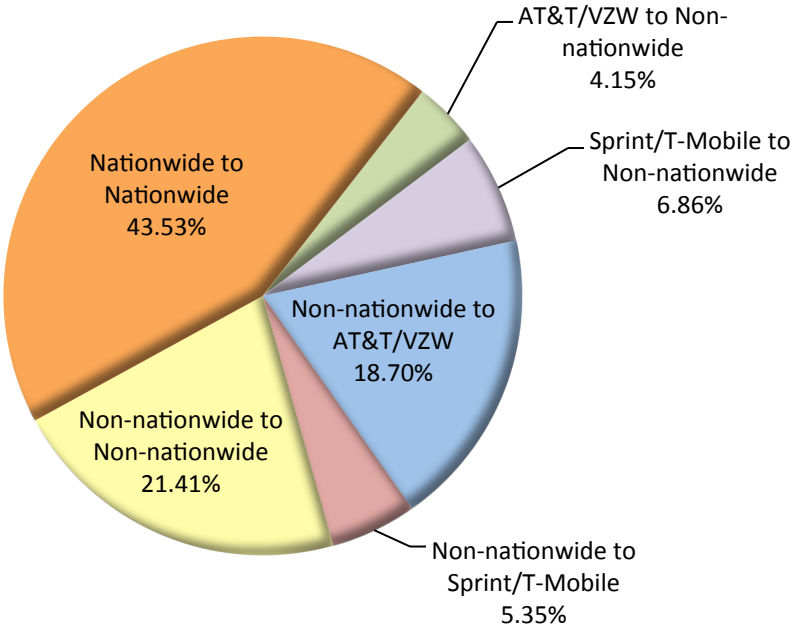
[1] In light of the varying geographic sizes and amount of spectrum included in different spectrum licenses, figures regarding amounts of spectrum acquired at auction or in secondary market transactions have been reduced to a common factor of MHz/POPs.

[2] For example, Sprint was a minority (5%) investor in SpectrumCo, a new entrant to the wireless arena. SpectrumCo acquired 20.62% of the total MHz/POPs won in Auction 66. As explained *infra* notes 52 and 66, that spectrum is not attributed to Sprint in this paper, because Sprint held less than a 10% interest in SpectrumCo.

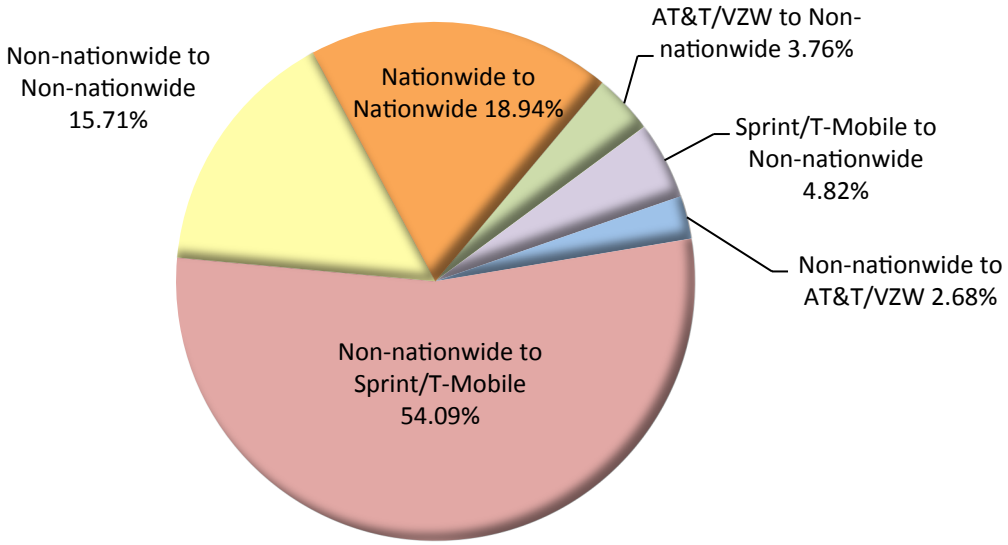
[3] The term "designated entities" refers to small and very small businesses that meet size or other criteria established for specific services.

Key Findings -- Secondary Market Transactions:

- Secondary market transactions also have been highly effective in creating a timely and efficient path for spectrum resources to be optimized across a broad array of operators.
    - Both non-nationwide and nationwide operators have secured substantial spectrum resources through secondary market license assignment and transfer transactions:



    - Spectrum leasing has opened another avenue to facilitate both non-nationwide and nationwide operator access to spectrum:



Key Conclusions:

- The evidence shows that allowing all wireless companies the opportunity to fully participate in spectrum auctions has not – and will not – prevent smaller operators from acquiring the spectrum they need to compete.
    - In the past nine auctions in which there were no bidding constraints, 559 bidders participated, 312 bidders won spectrum, and non-nationwide operators acquired nearly half of all available spectrum (46%).

- There is an abundance of evidence from prior auctions and secondary market transactions that the FCC's case-by-case spectrum holdings approach has successfully balanced the public interest in encouraging a vibrant, innovative mobile marketplace and promoting a broad distribution of licenses.
    - The FCC has several existing tools, which it can and does put to use to maintain this balance, such as requiring divestitures of spectrum in several secondary market transactions, and in one auction, following application of its spectrum screen.[4]

- Operators of all sizes have demonstrated over the past 10 years that they can successfully obtain spectrum via participation in auctions and secondary market transactions. Operators other than AT&T and Verizon Wireless won 63.15% of the MHz/POPs acquired at auction. They also are represented substantially in secondary market sale and lease transactions.

- In light of the track record of the past 10 years, the FCC's current policy of full auction participation, moderated by a case-by-case review of spectrum aggregation, is the most effective path to meeting the spectrum needs of a diverse wireless marketplace – and, far more important – our nation's mobile innovators and consumers, who increasingly depend on its ongoing health and vibrancy.

[4] *See* discussion *infra* Section I.B.

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I. INTRODUCTION

The need for additional wireless broadband spectrum continues to grow as a result of the virtuous cycle of wireless investment and innovation. As operators continue to make significant capital expenditures in technology and infrastructure – estimated at $35 billion in 2013 alone[5] – more Americans are adopting high-speed mobile broadband. Our wireless networks lead the world in delivering high-speed connections: U.S. consumers download data on their mobile devices at speeds over five times the global average.[6] And consumers are responding – by the end of the year, just one year into LTE deployment, LTE connections will represent nearly 20% of all U.S. mobile connections.[7] Smartphone adoption continues unabated. At the end of 2012, smartphones accounted for 152 million connections in the U.S.,[8] with an estimate of 130 million to be sold this year alone.[9] Furthermore, the stage is set for continued growth – nearly 92% of Americans have access to mobile broadband at speeds greater than 3 Mbps and nearly 80% have access at speeds greater than 10 Mbps.[10]

LTE deployment and the widespread adoption of smartphones and other wireless broadband devices have driven significant increases in mobile data consumption. The per-connection traffic for a U.S. customer will top 800 megabytes in 2013 – a three-fold increase from 2012.[11] In the U.S., mobile traffic rose from 866.8 billion megabytes in 2011 to 1.468 trillion megabytes in 2012.[12] Globally, mobile traffic is expected to increase 72% in 2013 to reach 23,000 petabytes – that is over 23 *million* gigabytes – and forecasts estimate that by 2018, mobile traffic will eclipse 131,000 petabytes.[13]

To meet the demands of consumers and our economy for more and more wireless data and to help accommodate mobile's unrelenting growth, policymakers are working to make

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[5] FCC, News Release, *Significant FCC Actions and Key Developments in the Broadband Economy*, at 1 (Mar. 22, 2013) ("*Significant FCC Actions News Release*"), *available at* http://hraunfoss.fcc.gov/edocs_public/attachmatch/-DOC-319728A1.pdf.

[6] The White House, Office of Science and Technology Policy and The National Economic Council, Four Years of Broadband Growth, at 6 (July 2013), *available at* http://www.whitehouse.gov/sites/default/files/broadband_-report_final.pdf.

[7] Navigant Economics, *Mobile Wireless Performance in the EU & the US*, at 21 (May 2013) ("Mobile Wireless Performance"), *available at* http://www.gsmamobilewirelessperformance.com/GSMA_Mobile_Wireless_-Performance_May2013.pdf.

[8] CTIA- The Wireless Association, *Background on CTIA's Semi-Annual Wireless Industry Survey*, at 6 (2013), http://files.ctia.org/pdf/CTIA_Survey_YE_2012_Graphics-FINAL.pdf.

[9] CTIA- The Wireless Association, White Paper: *Finding the FCC's 15 MHz*, at 3 (citing CEA, Consumer Electronics Detailed Forecast, 2011-2016 (Jan. 2013)), attached to Letter from Steve Largent, CTIA-The Wireless Association, President and CEO, to Julius Genachowski, FCC, Chairman, *et al*., GN Docket No. 09-51, (Mar. 13, 2013).

[10] *Significant FCC Actions News Release* at 6.

[11] Mobile Wireless Performance at 7.

[12] Stephen Lawson, *U.S. Mobile Data Traffic Grew 69 Percent Last Year, InfoWorld* (May 3, 2013), http://www.infoworld.com/d/mobile-technology/us-mobile-data-traffic-grew-69-percent-last-year-217852.

[13] ABI Research, *Mobile Traffic Forecast to Reach 131K PB in 2018* (June 3, 2013), http://www.abiresearch.com-/press/mobile-traffic-forecast-to-reach-131k-pb-in-2018-c. As a practical example of the size of a single petabyte, "[i]f the average MP3 encoding for mobile is around 1MB per minute, and the average song lasts about four minutes, then a petabyte of songs would last over 2,000 years playing continuously." Brian McKenna, *What does a petabyte look like*? ComputerWeekly.com, http://www.computerweekly.com/feature/What-does-a-petabyte-look-like.

additional spectrum resources available for mobile broadband services. The FCC awards licenses for commercial spectrum use. The agency has initiated proceedings to adopt:

- Rules to govern the upcoming broadcast incentive auction;[14]
- Service and licensing rules for spectrum in the AWS-3 band – including the 1695-1710 MHz and 1755-1780 MHz bands currently used by the Federal government;[15] and
- Procedures for the upcoming auction of H block AWS spectrum.[16]

The FCC also has modified its service rules to enhance the usefulness of existing commercial spectrum resources, including in the Mobile Satellite Service and Wireless Communications Service bands, for the provision of mobile broadband services.[17]

In connection with these efforts, the FCC is considering whether and how to modify its current policies regarding proposed mobile spectrum holdings, in part in response to claims by competitors other than AT&T and Verizon Wireless that changes are necessary to enable operators other than the two largest nationwide service providers to secure spectrum resources.[18] Proposals under consideration include an overall cap on mobile spectrum holdings, a cap specifically on spectrum holdings below 1 GHz, and auction eligibility restrictions.[19] Any policy changes that the FCC adopts could be in place prior to the upcoming auctions listed above, and could limit particular operators' participation in those auctions and impact future secondary market transactions in the sector, to the detriment of service to consumers and continued innovation and investment.

This paper examines the distribution of spectrum resources via spectrum auctions and secondary market transactions that have been evaluated under the FCC's current case-by-case approach to evaluating spectrum aggregation. Section I.A of this paper discusses how the FCC makes additional spectrum available to operators through spectrum auctions and through its review of secondary market transactions. Section I.B describes the FCC's current approach to reviewing proposed spectrum holdings. The paper covers auctions that occurred and secondary market transactions that closed between January 1, 2003 (the date on which the FCC's spectrum cap sunset, and after which the FCC began evaluating all proposed spectrum holdings via application of its spectrum screen) and May 31, 2013.

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[14] *Expanding the Economic and Innovation Opportunities of Spectrum Through Incentive Auctions*, Notice of Proposed Rulemaking, 27 FCC Rcd 12357 (2012) ("*Incentive Auction NPRM*").
[15] *Amendment of the Commission's Rules with Regard to Commercial Operations in the 1695-1710 MHz, 1755-1780 MHz, and 2155-2180 MHz Bands*, Notice of Proposed Rulemaking and Order on Reconsideration, 28 FCC Rcd 11479 (2013).
[16] *Auction of H Block Licenses in the 1915-1920 MHz and 1995-2000 MHz Bands; Comment Sought on Competitive Bidding Procedures for Auction 96*, Public Notice, 28 FCC Rcd 10013 (2013).
[17] *See, e.g.*, *Service Rules for Advanced Wireless Services in the 2000-2020 MHz and 2180-2200 MHz Bands*, Report and Order and Order of Proposed Modification, 27 FCC Rcd 16102 (2012); *Amendment of Part 27 of the Commission's Rules to Govern the Operation of Wireless Communications Services in the 2.3 GHz Band*, Order on Reconsideration, 27 FCC Rcd 13651 (2012).
[18] *See Policies Regarding Mobile Spectrum Holdings*, Notice of Proposed Rulemaking, 27 FCC Rcd 11710 (2012) ("*Mobile Spectrum Holdings NPRM*"); *Incentive Auction NPRM*, 27 FCC Rcd at 12483-84 ¶¶ 381-384.
[19] *Mobile Spectrum Holdings NPRM*, 27 FCC Rcd at 11720 ¶¶ 20-21, 11725-28 ¶¶ 35-39.

As discussed below, our research reflects that the FCC has successfully implemented Congress' mandate to efficiently allocate spectrum across a diverse array of companies including nationwide operators, non-nationwide operators, and small and very small businesses. The research confirms that these successes occurred without a spectrum cap in place or other restrictions on bidder participation in spectrum auctions or secondary market transactions. In fact, the data demonstrate that open auctions effectively distribute spectrum widely to all categories and size of operators. In addition, secondary markets work for all operators seeking access to spectrum.

A. The FCC Grants Access to Spectrum Resources through Spectrum Auctions and through its Review of Secondary Market Transactions

The FCC has exclusive jurisdiction under the Communications Act of 1934, as amended (the "Communications Act"),[20] to award licenses for the non-governmental use of electromagnetic spectrum.[21] The FCC awards spectrum usage rights through its initial licensing process (*e.g.*, spectrum auctions), or through consideration of and consent to secondary market transactions (*e.g.*, assignments of licenses, transfers of control of FCC licensees, and spectrum leasing arrangements).

Spectrum Auctions. In 1993, as part of the Omnibus Budget Reconciliation Act of 1993 ("OBR 93"), Congress granted the FCC authority to use competitive bidding (*i.e.*, spectrum auctions) as an additional tool for assigning licenses. In adopting the legislation, the House Budget Committee Report noted that the competitive bidding system was intended to ensure that spectrum would be "used more productively and efficiently than if handed out for free,"[22] finding that applicants who are required to pay for the right to hold the spectrum are likely to have a greater incentive to build-out and operate the spectrum and provide service and new technologies to customers.[23]

Recognizing that the award of spectrum licenses based solely upon the highest bid might unduly limit the ability of smaller companies or new companies to compete, Congress noted its expectation that "[t]he Commission will realize these goals by avoiding excessive concentration of licenses and by disseminating licenses among a wide variety of applicants, including small businesses and businesses owned by members of minority groups and women."[24] A number of provisions were incorporated into Section 309 of the Communications Act in order to foster participation in the telecommunications industry by small businesses and businesses owned by members of minority groups and women. Specifically, Section 309(j)(3) and (j)(4) require that the FCC, in designing its competitive bidding process and specifying eligibility to participate, seek to promote economic opportunity, competition, and innovation by distributing licenses

[20] 47 U.S.C. §§ 151 *et seq*.
[21] This paper focuses on the FCC's grant of spectrum usage rights to non-governmental operators for the provision of service on a commercial basis to consumers.
[22] H.R. REP. NO. 103-111, at 249 (1993).
[23] *Id*.
[24] *Id*. at 254.

broadly, and to consider, *inter alia*, alternative payment schedules, bidding preferences and other procedures.[25]

Based on those statutory considerations, the FCC has employed measures over the years to encourage the broad distribution of spectrum licenses. For example, the FCC set aside portions of the Personal Communications Service ("PCS") spectrum (*e.g.*, the broadband PCS C and F block licenses) for bidding solely by entities that qualified as "entrepreneurs."[26] Those "set-aside" licenses are sometimes referred to as "closed" licenses. In addition, the FCC permitted entrepreneur winners of PCS C and F block licenses to pay their winning bids over a ten-year period at attractive financial terms – referred to as "installment payment financing."[27] Finally, the FCC afforded, and continues to afford, small and very small businesses a discount off of their winning bid prices – referred to as "bidding credits."[28]

Since the set-aside of the broadband PCS C and F block spectrum for entrepreneurs, the FCC has not identified any new set-aside spectrum for bidding solely by entrepreneurs. In addition, after a number of entrepreneurs sought bankruptcy protection and then defaulted on their installment payment financing, the FCC ceased offering installment payment financing for closed C and F block PCS licenses acquired at auction.[29] A recent paper by the Analysis Group demonstrates that the use of restrictive auction participation rules such as set-asides has caused considerable harm to consumers in terms of the delay in spectrum deployment, reduction in auction revenues, and missed opportunities for innovation and economic growth.[30]

The availability of each of these types of benefits for entrepreneurs, small businesses and very small businesses (collectively referred to as "Designated Entities") in the auctions discussed in this paper is set forth in Section II.[31]

Secondary Market Transactions. Secondary market transactions are those in which an operator gains access to spectrum through private commercial transactions. Wireless operators may enter into agreements for, and seek FCC approval of, the assignment of FCC licenses from one entity to another, or for the acquisition of (and transfer of control over) an FCC licensee. In

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[25] 47 U.S.C. § 309(j)(4)(A), (C) and (D).

[26] In order to qualify as an "entrepreneur" to bid on set-aside licenses, a bidder was required to have gross revenues not exceeding $125 million for the two years preceding its application to participate in the auction, and total assets not exceeding $500 million at the time of the application to participate in the auction. 47 C.F.R. § 24.709(a).

[27] *Id*. §§ 24.711, 24.716, 1.2110(g).

[28] *Id*. §§ 1.2110(f)(1), (f)(2) (providing the revenue criterion for applicants to quality for 15%, 25% and 35% bidding credits); 1.2110(c)(1) (the FCC defines "small business" on a service-specific basis, after consideration of the characteristics and revenue requirements of the service).

[29] FCC Auction No. 11 (conducted between 1996-1997) was the last PCS auction in which the FCC made installment payment financing available. The next PCS auction (Auction No. 22, conducted in 1999) did not provide that financing option. *See* FCC, Auction 11: Broadband PCS D, E, & F Block, Factsheet for Auction 11, http://wireless.fcc.gov/auctions/default.htm?job=auction_factsheet&id=11 (last visited Aug. 8, 2013); FCC, Auction 22: C, D, E, and F Block Broadband PCS, Factsheet for Auction 22, http://wireless.fcc.gov/auctions/default.htm?-job=auction_factsheet&id=22 (last visited Aug. 8, 2013).

[30] Robert Earle and David W. Sosa, Analysis Group, *Spectrum Auctions Around the World: An Assessment of International Experienced with Auction Restrictions* (July 2013), *available at* http://mobilefuture.org/-resources/spectrum-auctions-around-the-world/.

[31] The FCC also offers bidding credits to operators who serve tribal lands. 47 C.F.R. § 1.2110(f)(3). Discussion of those bidding credits is beyond the scope of this paper.

2003, the FCC expanded the scope of secondary market transactions through which operators could gain access to additional spectrum resources by allowing licensees to lease their licensed spectrum to third parties, as means to achieve "more efficient and dynamic use of the important spectrum resource to the ultimate benefit of consumers throughout the country."[32] Spectrum leases can be short-term (not longer than one year) or long-term (over one year) in duration, and can be spectrum manager leases (where the licensee retains *de jure* control of its license and *de facto* control of the leased spectrum), or *de facto* transfer leases (where the licensee retains *de jure* control of its license, but *de facto* control of the leased spectrum is transferred to the lessee).[33] The distribution of spectrum resources through these secondary market vehicles is discussed in Section IV.

B. FCC Evaluation of Proposed Spectrum Holdings

Sections 309 and 310 of the Communications Act require the FCC to determine whether the assignment or award of spectrum to an entity – either through spectrum auctions or secondary market transactions – would serve the public interest, convenience, and necessity.[34] The FCC's public interest analysis is broad, and includes an evaluation of the potential competitive effects of the proposed spectrum holdings.[35]

From January 2, 1995 through January 1, 2003, the FCC's rules imposed a cap on Commercial Mobile Radio Service ("CMRS") spectrum holdings. Section 20.6 of the FCC's rules limited to 55 MHz the amount of broadband PCS, cellular or Specialized Mobile Radio ("SMR") spectrum regulated as CMRS that a licensee could hold, or in which it could have an attributable interest.[36] Operators seeking to acquire spectrum holdings above the amount permitted by the cap could seek a waiver of the rule under certain circumstances.[37] During this period, the FCC evaluated proposed spectrum holdings based on this cap, and considered waiver requests on a case-by-case basis.

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[32] *Promoting Efficient Use of Spectrum Through Elimination of Barriers to the Development of Secondary Markets*, Report and Order and Further Notice of Proposed Rulemaking, 18 FCC Rcd 20604, 20607 ¶ 2 (2003) ("*Secondary Markets Report and Order*"). These rules were adopted by the FCC in 2003, and became effective in the beginning of 2004.

[33] 47 C.F.R. § 1.9003.

[34] 47 U.S.C. §§ 309(a), 309(j)(5), 310(d).

[35] For example, in the context of a transaction, the FCC assesses whether the proposed transaction complies with the specific provisions of the Communications Act, other applicable statutes, and the FCC's rules. If the transaction does not violate a statute or rule, the FCC next considers whether it could result in public interest harms by substantially frustrating or impairing the objectives or implementation of the Communications Act or related states. To do so, the FCC employs a balancing test weighing any potential public interest harms of the proposed transaction against any potential public interest benefits. *See, e.g.*, *Applications of AT&T Mobility Spectrum LLC, New Cingular Wireless PCS, LLC, Comcast Corporation, Horizon Wi-Com, LLC, NextWave Wireless, Inc., and San Diego Gas & Electric Company*, Memorandum Opinion and Order, 27 FCC Rcd 16459, 16463-64 ¶ 10 (2012) ("*AT&T WCS Order*").

[36] 47 C.F.R. § 20.6(a) (effective Jan. 2, 1995; sunset Jan. 1, 2003). The spectrum cap rule was amended during its lifetime, but ultimately the cap was set at 55 MHz. The rule replaced other FCC rules that had established a limit on collective cellular/broadband PCS holdings, and a PCS-specific spectrum cap.

[37] *Id*. § 20.6 (Note 3) (*e.g.*, waivers could be granted where the requesting party demonstrated that it did not have *de jure* or *de facto* control of the licensee, that the acquisition was not likely to impact the local market in an anticompetitive manner, and that the public benefits outweighed any potential anticompetitive harm to the market).

Since the spectrum cap sunset in January 2003, the FCC has evaluated proposed spectrum holdings based, in part, on a case-by-case review of the competitive effects of spectrum aggregation by specific companies. This case-by-case analysis applies both in the context of secondary market transactions and spectrum auctions.[38]

As part of this analysis, the FCC uses an initial two-part screen to help identify local markets where competitive concerns are more likely to arise, and where the acquisition of spectrum provides particular reason for further competitive analysis. The FCC's further competitive analysis, however, is not limited solely to the markets identified by the initial screen.[39] The first part of the screen is based on the size of the post-transaction Herfindahl-Hirschman Index ("HHI"), and the change in the HHI.[40] The second part of the screen – referred to as the "spectrum screen" – identifies local markets where an entity would acquire more than approximately one-third of the total spectrum suitable and available for the provision of mobile telephony/broadband services.[41]

The FCC has determined that cellular, broadband PCS, SMR, 700 MHz, and WCS spectrum, as well as AWS-1 and a portion of the BRS spectrum where available, meet the definition of suitable and available spectrum and are therefore included in the spectrum screen.[42] The current screen is triggered where applicants would have, on a market-by-market basis: 102 MHz or more of cellular, broadband PCS, SMR, 700 MHz and WCS spectrum, where neither BRS nor AWS-1 spectrum is available; 121 MHz or more spectrum, where BRS spectrum is available, but AWS-1 spectrum is not available; 132 MHz or more spectrum, where AWS-1 spectrum is available, but BRS spectrum is not; or 151 MHz or more spectrum, where both AWS-1 and BRS spectrum are available.[43]

The FCC can, and will, order divestitures if it determines that spectrum aggregation from a proposed transaction would cause competitive harm in certain markets.[44] The FCC also has required divestitures in the auctions context. In the *Union/Verizon Wireless Order*, the FCC found that grant of Auction 73 licensing applications of Union Telephone Company and Cellco Partnership d/b/a Verizon Wireless was in the public interest, subject to the effectuation of a

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[38] *See Union Telephone Company, Cellco Partnership d/b/a Verizon Wireless*, Memorandum Opinion and Order, 23 FCC Rcd 16787, 16791 ¶ 9 (2008) ("*Union/Verizon Wireless Order*").

[39] *See, e.g.*, *AT&T WCS Order*, 27 FCC Rcd at 16467 ¶ 21; *Applications of Deutsche Telekom AG, T-Mobile USA, Inc., and MetroPCS Communications, Inc.*, Memorandum Opinion and Order and Declaratory Ruling, 28 FCC Rcd 2322, 2330-31 ¶ 22 (WTB/IB 2013) ("*T-Mobile/MetroPCS Order*").

[40] The HHI is a measure of concentration within a market. The change in HHI following a transaction reflects the change in market concentration resulting from the transaction.

[41] *See, e.g.*, *T-Mobile/MetroPCS Order*, 28 FCC Rcd at 2335 ¶ 38.

[42] *See id*., 28 FCC Rcd at 2333-34 ¶ 34.

[43] *See AT&T WCS Order*, 27 FCC Rcd at 16471 n.94.

[44] *See, e.g.*, *Applications of Cellco Partnership d/b/a Verizon Wireless and Rural Cellular Corporation*, Memorandum Opinion and Order and Declaratory Ruling, 23 FCC Rcd 12463, 12512-13 ¶ 113 (2008) (requiring divestiture of certain operating units, including the spectrum associated with such units, in six markets); *AT&T Inc. and Dobson Communications Corp.*, Memorandum Opinion and Order, 22 FCC Rcd 20295, 20336 ¶ 88 (2007) (requiring divestiture of operating units, including spectrum associated with such units); *Applications of AT&T Wireless Services, Inc. and Cingular Wireless Corporation*, Memorandum Opinion and Order, 19 FCC Rcd 21522, 21620-22 ¶¶ 254-256 (2004) (requiring divestiture of certain operating units, including spectrum associated with such operating units, in 17 markets, divestitures of 10 MHz of PCS spectrum in two markets, and divestitures of cellular and broadband PCS spectrum in 43 counties).

voluntary commitment by Verizon Wireless to divest a single market. Specifically, as part of its market-by-market analysis, the FCC determined that, after implementation of the voluntary divestiture commitment, even though Verizon Wireless's spectrum holdings would exceed the spectrum screen in 18 markets, there was no competitive harm and therefore Verizon Wireless would not have to divest any additional spectrum.[45]

As demonstrated in detail below, the FCC's current case-by-case application of the spectrum screen over the past 10 years has resulted in the distribution of spectrum resources not only to Nationwide Operators (AT&T, Sprint, T-Mobile, Verizon Wireless and their respective subsidiaries), but also to Non-nationwide Operators, Designated Entities, and new entrants into the wireless arena.

II. DISTRIBUTION OF SPECTRUM RESOURCES FROM FCC SPECTRUM AUCTIONS CONDUCTED UNDER THE SPECTRUM SCREEN

The FCC conducted 39 spectrum auctions during the period covered by this paper (January 1, 2003 through May 31, 2013). This paper addresses the subset of those auctions in which the FCC auctioned spectrum that could be used for the provision of terrestrial mobile broadband service, as discussed in greater detail below.[46] All of the auctions discussed in this paper were conducted without any restrictions on participation and bidding, except for bidding on certain PCS licenses for C block spectrum included in Auctions 58, 71 and 78 which were available solely to entrepreneurs. Thus, except for those discrete licenses, all bidders were eligible to place bids on, and acquire, any license included in any of the auctions. In each case, the FCC conducted post-auction evaluations of the spectrum holdings that would result from granting licenses for winning bids submitted at auction, and required divestitures where it found them warranted.

Analysis of the results of these wireless spectrum auctions demonstrates that, while the vast majority of licenses auctioned during the 10-year period covered by this paper were open for bidding by all auction participants, and there was no cap in place that limited or constrained bidders' auction participation, auctions have worked effectively to distribute spectrum resources to Nationwide Operators, Non-nationwide Operators, and Designated Entities.[47]

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[45] *See Union/Verizon Wireless Order*, 23 FCC Rcd at 16796 ¶ 18.

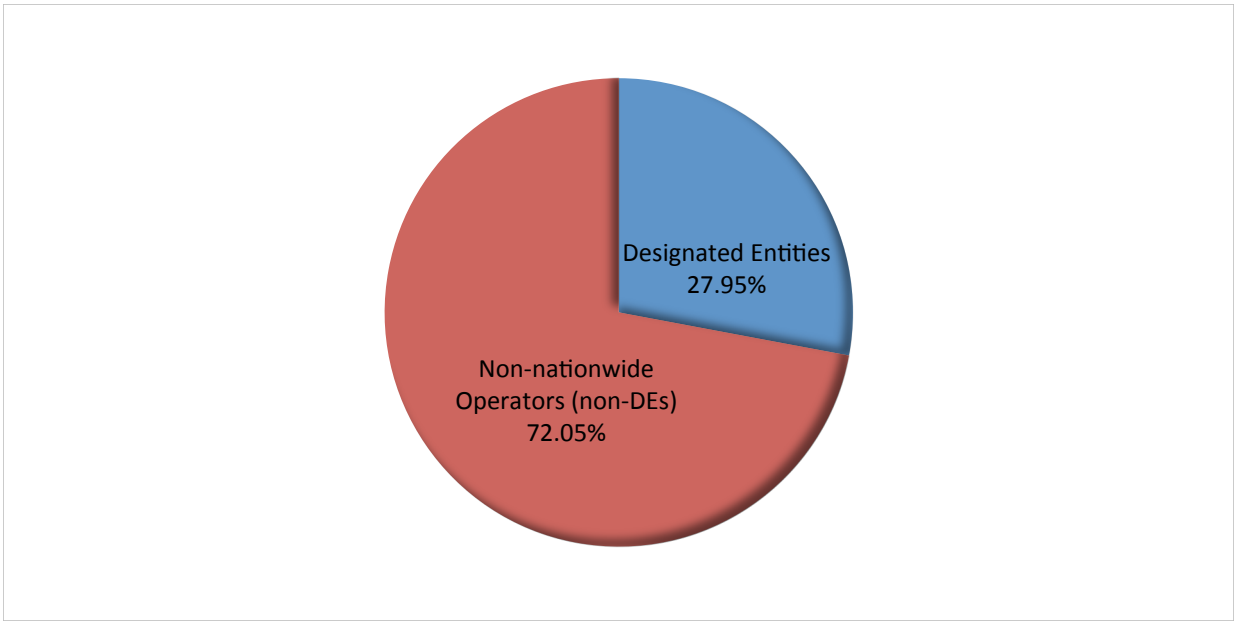
[46] This paper does not address auctions conducted during this timeframe for broadcast radio and television service spectrum (Auctions 54, 62, 64, 68, 70, 79, 81, 85, 88, 90, 91, 93, 94), for paging, narrowband PCS, and 900 MHz SMR spectrum (Auctions 48, 50, 51, 55, 87), or auctions of spectrum not otherwise contemplated for mobile broadband use – *i.e.*, Auction 46 (1670-1675 MHz band), Auction 52 (DBS), Auction 53 (MVDDS), Auction 56 (24 GHz), Auction 57 (AMTS), Auction 59 (MAS), Auction 61 (AMTS), Auction 63 (MVDDS), Auction 65 (800 MHz Air-Ground), Auction 69 (1.4 GHz Bands – 2 to 3 MHz licenses), Auction 72 (220 MHz), and Auction 77 (closed cellular).

[47] In certain of the auctions discussed in this paper, Nationwide Operators participated through non-controlling investments in Designated Entities. Spectrum acquired at auction by those Designated Entities, and spectrum sold/acquired in secondary market transactions, is included in the Designated Entity category, and not in the Nationwide Operators category, since even though the spectrum, for regulatory purposes, is attributed to the Nationwide Operators, they could not control the Designated Entities.

A. Auction 49 (Lower 700 MHz) – 2003

The FCC auctioned 256 licenses in the Lower 700 MHz Band C block (2 x 6 MHz paired) and D block (6 MHz unpaired) spectrum.[48] Bidding credits were available to small and very small businesses, and entrepreneurs. There were no restrictions on eligibility to participate in the auction; all auction participants were free to bid on any license included in the auction.[49] 35 auction participants won 251 of the 256 licenses available at that auction.[50] No Nationwide Operator acquired any spectrum in this auction. Non-nationwide Operators acquired 72.05% of the MHz/POPs sold at the auction, with Designated Entities acquiring the remaining 27.95%.[51] The distribution of the spectrum won at this auction is reflected in Figure 1.[52]

Figure 1: Distribution of MHz/POPs acquired in Auction 49.



B. Auction 58 (Broadband PCS) – 2005

Auction 58 was a re-auction of 242 PCS licenses, the lion's share of which were in the previously set-aside C block. Licenses offered were for the A block (2 licenses - 30 MHz each), C block (188 licenses - a mix of 10 MHz and 15 MHz licenses), D block (11 licenses 10 MHz

[48] FCC, Auction 49: Lower 700 MHz Band, Factsheet for Auction 49, http://wireless.fcc.gov/auctions/default-.htm?job=auction_factsheet&id=49 (last visited Aug. 8, 2013).
[49] *Auction of Licenses in the Lower 700 MHz Band Scheduled for May 28, 2003*, Public Notice, 18 FCC Rcd 3138, 3152-53 (2003).
[50] Factsheet for Auction 49, *supra* note 48.
[51] Nationwide Operators acquired 2,087,278,236 MHz/POPs; Designated Entities acquired 583,309,020 MHz/POPs.
[52] Auction results data were derived from data downloaded from FCC auction and license records. Data regarding the licenses (including MHz/POPs) available in each auction were based upon license lists released by the FCC in connection with each auction. Analysis of winners of spectrum at auction was based upon analysis of post-auction long form applications filed by winning bidders. Determination of whether a winning bidder was affiliated with a Nationwide Operator was based upon review of the Nationwide Operators' FCC Form 602 ownership reports. Spectrum was attributed to one of the Nationwide Operators if that operator held at least a 10% ownership interest in the auction participant.

each), E block (20 licenses - 10 MHz each), and F block (21 licenses - 10 MHz each).[53] It was the fifth auction of C block PCS spectrum, and the fourth auction of F block PCS spectrum. Bidding on the C and F blocks had been restricted to entrepreneurs when those licenses were initially awarded in FCC Auctions 5, 10 and 11 in the 1995-1997 period. The FCC again set aside the C and F block spectrum for entrepreneurs when it re-auctioned hundreds of those licenses in Auction 22 in 1999, after entrepreneurs failed to meet the financial obligations arising out of the installment payment financing.[54]

After additional defaults of set-aside C and F block licenses by entrepreneurs, the FCC in 2000 opened eligibility for all to bid on F block licenses and certain portions of the C block spectrum (depending on the specific sub-block of frequencies, population of the market, and whether the spectrum was offered but not sold in Auction 22), and once again re-auctioned C and F block spectrum via Auction 35 in 2000-2001.[55] While 35 bidders won all 422 licenses offered at that auction, many of those licenses were never granted to the winning bidders because of litigation between NextWave and the FCC.[56]

Subsequent settlements between the FCC and entrepreneurs who had defaulted on installment payment financing obligations made C and F block spectrum (including 60 licenses returned by NextWave) available for auction again in 2005, and the FCC announced that it would conduct Auction 58.[57] Similar to Auction 35, the FCC allowed open eligibility for all of the F block licenses and certain of the C block licenses. Small and very small businesses were eligible for bidding credits with respect to "open" licenses (of which there were 123 available); 119 of the C block licenses remained "closed" – available only to entrepreneurs.[58]

Twenty-four bidders won 217 of the 242 licenses available in Auction 58.[59] Verizon Wireless acquired less than 10%[60] of the total MHz/POPs won at the auction. AT&T, Sprint and T-Mobile participated in Auction 58 solely through investments in Designated Entities (Edge Mobile, LLC, Wirefree Partners III, LLC, and Cook Inlet/VoiceStream GSM VII PCS, LLC, respectively). Non-nationwide Operators acquired 5.38% of the MHz/POPs won; and Designated Entities acquired the remaining 85.03%.[61] This is reflected in Figure 2.

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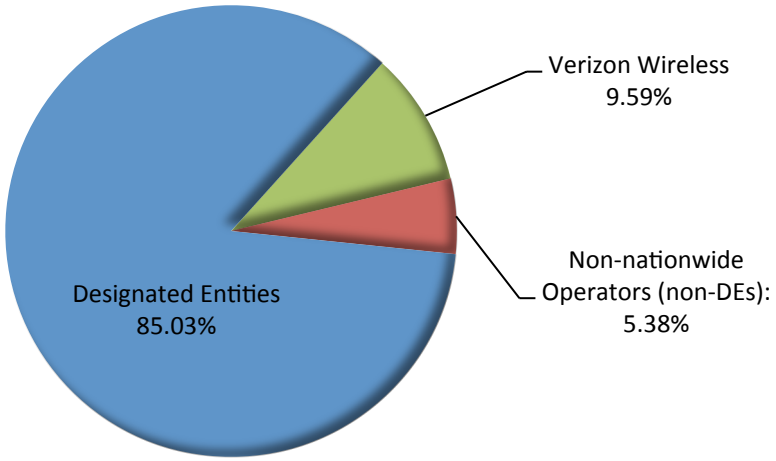
[53] FCC, Auction 58: Broadband PCS, Factsheet for Auction 58, http://wireless.fcc.gov/auctions/default.htm?-job=auction_factsheet&id=58 (last visited Aug. 8, 2013).
[54] Factsheet for Auction 22, *supra* note 29; *Auction of C, D, E, and F Block Broadband PCS Licenses*, Public Notice, 13 FCC Rcd 24540, 24550 (1998).
[55] FCC, Auction 35: C and F Block Broadband PCS, Factsheet for Auction 35, http://wireless.fcc.gov/auctions/-default.htm?job=auction_factsheet&id=35 (last visited Aug. 8, 2013); *Broadband PCS Spectrum Auction Scheduled for January 12, 2005*, Public Notice, 19 FCC Rcd 18190, 18194 (2004) ("*January 2005 Auction Public Notice*").
[56] *FCC v. NextWave Personal Communications, Inc.*, 537 U.S. 293 (2003), 254 F.3d 130, *affirmed*.
[57] *January 2005 Auction Public Notice*, 19 FCC Rcd at 18195.
[58] *Id*., 19 FCC Rcd at 18195-96.
[59] Factsheet for Auction 58, *supra* note 53.
[60] Verizon Wireless acquired 199,849,489.41 MHz/POPs at the auction.
[61] Non-nationwide Operators acquired 1,883,364,405.84 MHz/POPs, of which 1,771,402,175.84 MHz/POPs were acquired by Designated Entities.

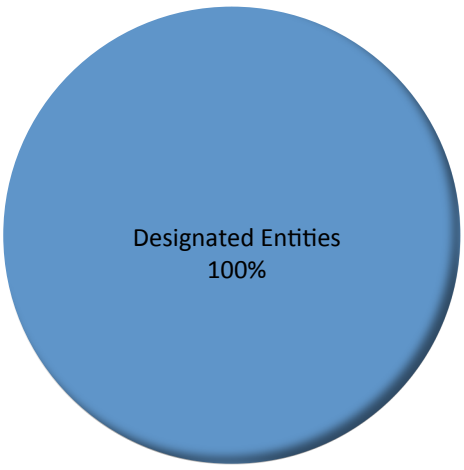
Figure 2: Distribution of MHz/POPs acquired in Auction 58.



C. Auction 60 (Lower 700 MHz) – 2005

Auction 60 included five 700 MHz C block (2 x 6 MHz paired) licenses that remained unsold in Auction 49. The FCC allowed open eligibility; there were no restrictions or limitations on the licenses on which participants could bid. Small and very small businesses, and entrepreneurs, were afforded bidding credits on the available licenses.[62] Three bidders won the five licenses available. None of the Nationwide Operators won spectrum in that auction. The entire 5,826,648.00 MHz/POPs available were acquired by Non-Nationwide Operators, all of which were Designated Entities. This is depicted in Figure 3.

Figure 3: Distribution of MHz/POPs acquired in Auction 60.



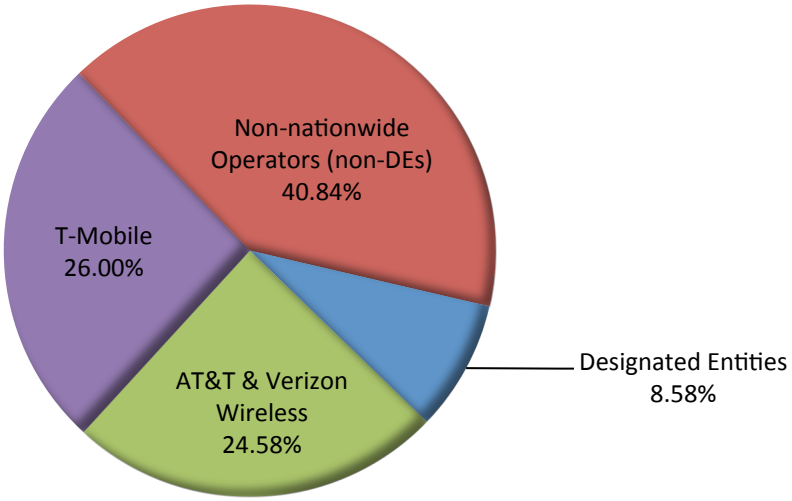
[62] *Auction of Lower 700 MHz Band Licenses Scheduled for July 20, 2005*, Public Notice, 20 FCC Rcd 6120, 6134-35 (2005).

D. Auction 66 (AWS-1) – 2006

The FCC conducted its first AWS auction in 2006, introducing 90 MHz of spectrum into the spectrum-hungry wireless sector. Six blocks of spectrum were offered: A block (2 x 10 MHz paired), B block (2 x 10 MHz paired), C block (2 x 5 MHz paired), D block (2 x 5 MHz paired), E block (2 x 5 MHz paired), and F block (2 x 10 MHz paired).[63] 168 entities successfully applied to participate in the auction.[64] There were no bidding or eligibility restrictions imposed. Small and very small businesses were entitled to bidding credits on the licenses available in the auction.[65]

104 bidders won 1087 of the 1122 licenses available at the auction. The total MHz/POPs won was almost evenly divided between Nationwide Operators (who acquired 50.58% of the total MHz/POPs won at the auction) and Non-nationwide Operators (who secured the remaining 49.42% of the MHz/POPs won at the auction, of which 8.58% were acquired by Designated Entities). As between the Nationwide Operators, T-Mobile acquired a larger portion of the MHz/POPs won at the auction (26.00%) than did AT&T and Verizon Wireless together (24.58%).[66] This distribution is reflected in Figure 4.

Figure 4: Distribution of MHz/POPs acquired in Auction 66.



[63] FCC, Auction 66: Advanced Wireless Services (AWS-1), Factsheet for Auction 66, http://wireless.fcc.gov/-auctions/default.htm?job=auction_factsheet&id=66 (last visited Aug. 8, 2013).
[64] Factsheet for Auction 66, *supra* note 63.
[65] *Auction of Advanced Wireless Services Licenses Scheduled for June 29, 2006*, Public Notice, 21 FCC Rcd 4562, 4584-85 (2006).
[66] Nationwide Operators acquired 12,916,129,000 MHz/POPs at the auction; Non-nationwide Operators secured the remaining 12,623,364,970 MHz/POPs, of which 2,192,246,850 MHz/POPs were acquired by Designated Entities. AT&T and Verizon Wireless together acquired 6,277,411,000 MHz/POPs; T-Mobile acquired 6,638,718,000 MHz/POPs, representing 26% of the MHz/POPs at the auction. Sprint participated in this auction solely through a non-attributable 5% investment in SpectrumCo, which acquired 5,267,189,450.00 MHz/POPs at the auction, representing 20.62% of the total MHz/POPs won.

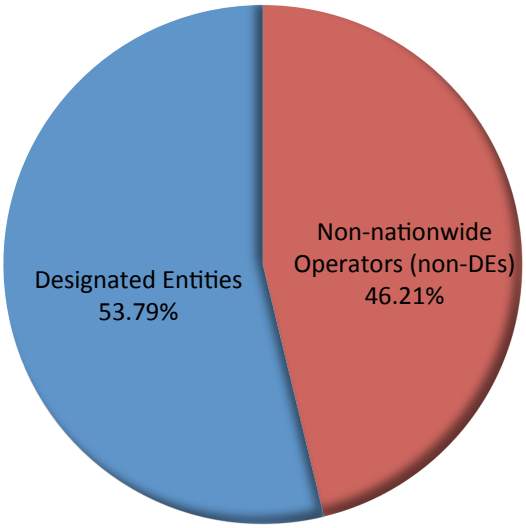
The results of this auction are instructive for a number of reasons. First, the AWS-1 auction was a substantial introduction of much needed spectrum at a time when operators were transitioning from 2G to 3G service. In addition, all of the Nationwide Operators participated (either directly, through wholly-owned or controlled subsidiaries, or via minority investments[67]), in addition to a very large number of Non-nationwide Operators and Designated Entities, so there was significant diversity among the companies competing for the spectrum. More than half of the winning bidders were designated entities.[68] A new entrant to the wireless arena – SpectrumCo (a consortium of cable operators) – was the third highest winning bidder (in terms of net winning bid amounts),[69] winning 137 licenses.[70] The FCC's policy of open and unrestricted participation in auctions, with post-auction review of proposed spectrum holdings, resulted in a balanced allocation of spectrum.

E. Auction 71 (Broadband PCS) – 2007

Auction 71 included 38 broadband PCS licenses that either had not sold in prior auctions, or were returned to the FCC as the result of license cancellation or termination. Again, most of the licenses in this auction were in the C block. Licenses offered included the A block (3 licenses – 30 MHz each), C block (26 licenses, a mixture of 10 MHz and 15 MHz each), D block (1 license – 10 MHz), E block (2 licenses – 10 MHz), and F block (6 licenses – 10 MHz). Bidding on the A, D, E, and F blocks was not restricted.[71] Bidding on the C block spectrum remained restricted for certain licenses based on market size and frequency band; however, the FCC opened up bidding for any previously-closed C block license if it had been offered, but not won, in any auction beginning on or after March 23, 1999 (this pertained to 9 of the 26 C block licenses offered).[72] Small and very small businesses were eligible for bidding credits on "open" C- and F-block licenses.[73] Twelve bidders won 33 of the 38 licenses offered in Auction 71. None of the Nationwide Operators acquired any spectrum in this auction. Non-nationwide Operators acquired all of the MHz/POPs won at the auction; of that, 53.79% of the MHz/POPs were acquired by Designated Entities.[74] This is reflected in Figure 5.

[67] Sprint held a non-attributable 5% interest in SpectrumCo.
[68] *See* FCC, News Release, *FCC's Advanced Wireless Services (AWS) Spectrum Auction Concludes* (rel. Sept. 18, 2006) ("*AWS News Release*"); FCC, News Release, *Statement of Chairman Kevin J. Martin on the Conclusion of Advanced Wireless Services Auction* (rel. Sept. 18, 2006).
[69] Net winning bid amounts are gross bids minus any bidding credits to which the winning bidder may be entitled.
[70] *See AWS News Release*.
[71] *Auction of Broadband PCS Spectrum Scheduled for May 16, 2007*, Public Notice, 22 FCC Rcd 433, 437 ¶ 8 (2007).
[72] *Id*., 22 FCC Rcd at 437 ¶ 8.
[73] *Id*., 22 FCC Rcd at 437 ¶ 9.
[74] A total of 61,698,465.00 MHz/POPs were won, of which 33,187,835.00 MHz/POPs were won by Designated Entities.

Figure 5: Distribution of MHz/POPs acquired in Auction 71.



F. Auction 73 (700 MHz) – 2008

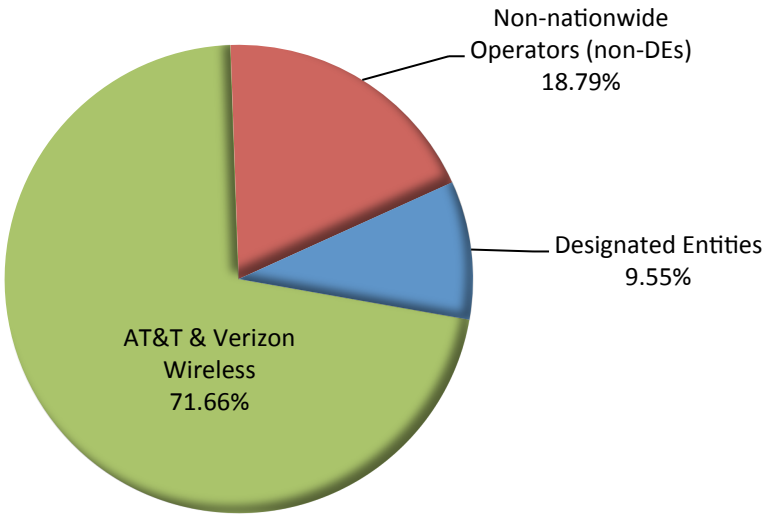
Auction 73 made available an additional 62 MHz of spectrum as a result of the transition to digital television. Licenses were offered in the Lower 700 MHz A block (2 x 6 MHz paired), B block (2 x 6 MHz paired), and E block (6 MHz unpaired), and in the Upper 700 MHz C block (2 x 11 MHz paired) and D block (2 x 5 MHz paired).[75] The FCC did not restrict bidding on any of these licenses, and made bidding credits available to small and very small businesses.[76] Also, the FCC imposed certain block-specific obligations on winners of C block spectrum (network access requirements)[77] and the D block licensee (to enter into a public/private partnership to construct a nationwide broadband public safety network).[78] There also were Channel 51 interference issues. All three of these restrictions resulted in increased interest in the Lower B block. The spectrum offered sparked significant interest among potential bidders – in fact, 214 entities applied to bid in the auction. Of the Nationwide Operators, AT&T and Verizon Wireless applied to bid; Sprint and T-Mobile did not.

101 bidders won 1090 of the 1099 licenses offered.[79] The two Nationwide Operators that participated in the auction won 71.66% of the total MHz/POPs won at the auction. Non-nationwide Operators acquired the remaining 28.34% of the MHz/POPs won, with Designated Entities acquiring 9.55% of the MHz/POPs won.[80] A new entrant to the wireless arena, Manifest

[75] *Auction of 700 MHz Band Licenses Scheduled for January 24, 2008*, Public Notice, 22 FCC Rcd 18141, 18147 ¶ 12 (2007).
[76] *Id.*, 22 FCC Rcd at 18162-63 ¶¶ 70-73.
[77] 47 C.F.R. § 27.16.
[78] *Id.* §§ 27.1301 *et seq*.
[79] FCC, Auction 73: 700 MHz Band, Factsheet for Auction 73, http://wireless.fcc.gov/auctions/default.htm?-job=auction_factsheet&id=73 (last visited Aug. 8, 2013).
[80] AT&T and Verizon Wireless together won 10,618,216,362.00 MHz/POPs; Non-nationwide Operators acquired 4,198,514,422 MHz/POPs, of which Designated Entities acquired 1,415,309,500.00 MHz/POPs.

Wireless (f/k/a Frontier Wireless) – a subsidiary of EchoStar – secured a near-nationwide footprint of E block spectrum. This distribution is reflected in Figure 6.

Figure 6: Distribution of MHz/POPs acquired in Auction 73.



Decisions regarding auction participation were based on factors such as business plans, network technologies, subscriber penetration rates, usage patterns, characteristics of the individual bands available for auction, and other considerations. As a result of those decisions, the distribution of spectrum in this auction differs from other auctions, as AT&T and Verizon Wireless won 71.66% of the spectrum. Similarly, Sprint – through its investment in Clearwire – participated in Auction 86 (AT&T and Verizon Wireless did not), and it secured 89.95% of the spectrum.

Non-nationwide Operators won a license in every market; 99 bidders, other than the Nationwide Operators, won 754 licenses – representing approximately 69% of the 1090 licenses sold; and 75 new players won licenses to serve 305 rural areas of the country. 56 of 101 total winning bidders (representing 55% of those winning bidders) claimed designated entity bidding credits as small businesses, and won 379 (35%) of 1090 licenses.[81]

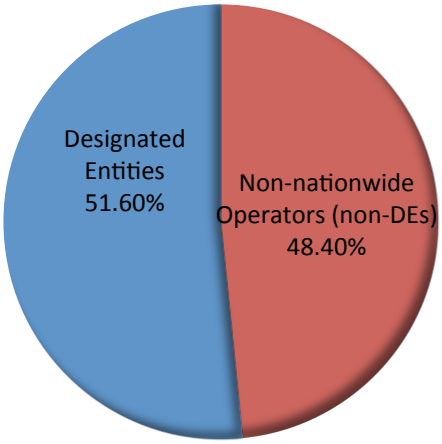
G. Auction 78 (AWS-1 & Broadband PCS) – 2008

The FCC auctioned 55 licenses in Auction 78 – 35 AWS-1 licenses not sold in Auction 66, and 20 broadband PCS licenses in the C, D, E, and F blocks that were not previously sold or that were cancelled for failure to meet build-out requirements.[82] Bidding was open on all of the licenses except for nine C block licenses available only to entrepreneurs.[83] Small and very small businesses were eligible for bidding credits on open licenses.[84] 16 bidders won 53 of the 55

[81] FCC, News Release, Statement by Chairman Kevin J. Martin, at 1 (rel. Mar. 20, 2008).
[82] *Auction of AWS-1 and Broadband PCS Licenses Scheduled for August 13, 2008*, Public Notice, 23 FCC Rcd 7496, 7499-01 ¶¶ 6-11(2008).
[83] *Id.*, 23 FCC Rcd at 7500-02 ¶¶ 7-12.
[84] *Id.*, 23 FCC Rcd at 7521-22 ¶¶ 90-93.

licenses offered.[85] Nationwide Operators did not acquire any spectrum in this auction. Designated Entities acquired almost half of the spectrum won.[86] This is reflected in Figure 7.

Figure 7: Distribution of MHz/POPs acquired in Auction 78.

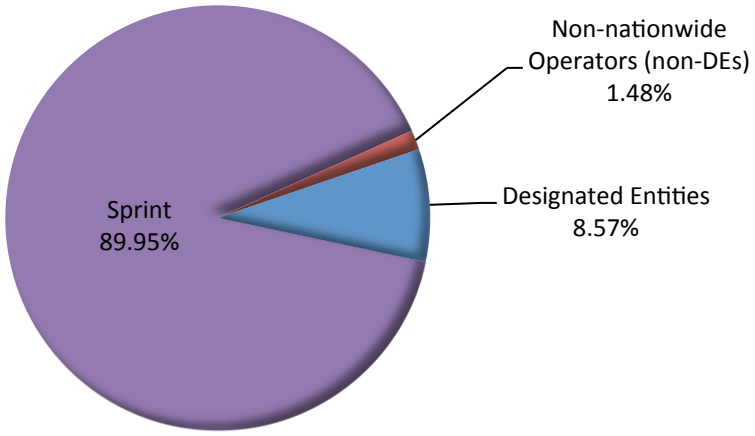


H. Auction 86 (BRS) – 2009

The FCC offered geographic overlay licenses in the BRS band in Auction 86. The auction included 78 licenses, making available 76.5 MHz of spectrum, subject to incumbent operations.[87] The FCC did not impose any restrictions on bidding, and made bidding credits available on all licenses to small and very small businesses as well as to entrepreneurs.[88] Ten bidders won 61 of the 78 licenses offered. Nationwide Operator Sprint (through its investment in bidder Clearwire) acquired the lion's share of this spectrum, winning 89.95% of the MHz/POPs won at the auction. AT&T and Verizon Wireless did not participate in this auction. Non-nationwide Operators acquired the remaining 10.05% of the MHz/POPs won at the auction, with Designated Entities acquiring 8.57% of the MHz/POPs.[89] These distributions are reflected in Figure 8.

[85] FCC, Auction 78: AWS-1 and Broadband PCS, Factsheet for Auction 78, http://wireless.fcc.gov/auctions/-default.htm?job=auction_factsheet&id=78 (last visited Aug. 8, 2013).
[86] Non-nationwide Operators acquired 201,690,719.00 MHz/POPs, of which Designated Entities acquired 104,075,249.00 MHz/POPs.
[87] *Auction of Broadband Radio Service (BRS) Licenses Scheduled for October 27, 2009*, Public Notice, 24 FCC Rcd 8277, 8280-81 ¶¶ 4-7(2009).
[88] Entrepreneur status, for purposes of BRS bidding credits, was based on the bidder having attributed average annual gross revenues not exceeding $3 million for the preceding three years. Entrepreneurs were entitled to 35% bidding credits. *Id*., 24 FCC Rcd at 8296 ¶ 72.
[89] Sprint and T-Mobile together acquired 1,404,066,312.00 MHz/POPs. Non-nationwide Operators acquired 156,786,826.50 MHz/POPs, of which 133,708,459.50 MHz/POPs were acquired by Designated Entities.

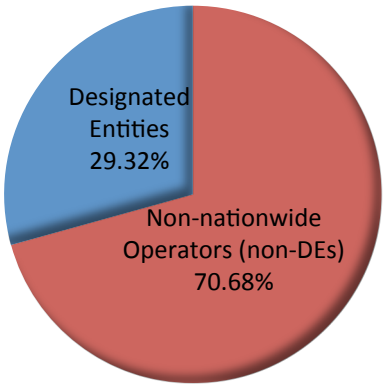
Figure 8: Distribution of MHz/POPs acquired in Auction 86.



I. Auction 92 (700 MHz) – 2011

Auction 92 included 16 A and B block licenses in the Lower 700 MHz Band that either were not acquired in Auction 73, or were defaulted on post-auction.[90] Bidding was not restricted on any of the licenses; small and very small businesses were eligible for bidding credits.[91] Seven bidders acquired all 16 licenses.[92] Nationwide Operators did not acquire any spectrum at the auction. Non-nationwide Operators acquired all of the MHz/POPs won at auction, with Designated Entities acquiring 29.32% of the MHz/POPs won,[93] as reflected in Figure 9.

Figure 9: Distribution of MHz/POPs acquired in Auction 92.

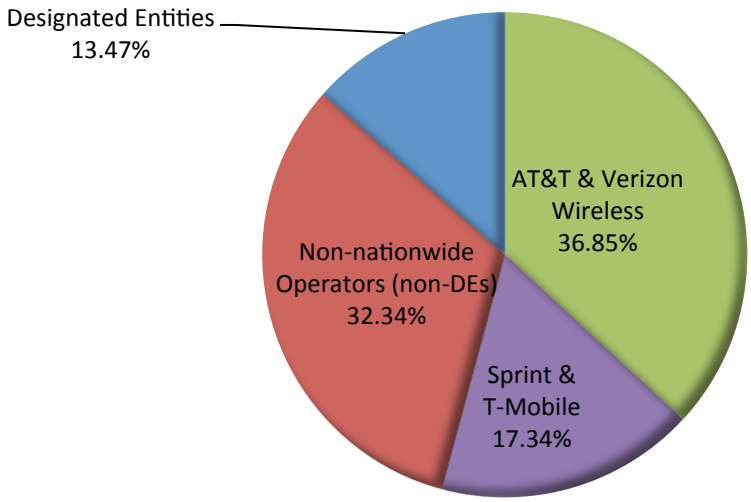


[90] *Auction of 700 MHz Band Licenses Scheduled for July 19, 2011*, Public Notice, 26 FCC Rcd 3342, 3344 ¶¶ 3-4 (2011).
[91] *Id.*, 26 FCC Rcd at 3358-59 ¶¶ 64-67.
[92] FCC, Auction 92: 700 MHz Band, Factsheet for Auction 92, http://wireless.fcc.gov/auctions/default.htm?-job=auction_factsheet&id=92 (last visited Aug. 8, 2013).
[93] Non-nationwide Operators acquired 35,532,228.00 MHz/POPs, of which Designated Entities acquired 10,419,168.00 MHz/POPs.

J. Results of Distributing Spectrum through Auctions in the Decade 2003-2013

Aggregation of the individual auction data presented above reflects that FCC spectrum auctions conducted from 2003 to 2013 have resulted in the broad distribution of spectrum resources to Nationwide Operators, Non-nationwide Operators, and Designated Entities. Nationwide Operators (collectively) secured 54.19% of the total MHz/POPs awarded through the auctions discussed above. Non-nationwide Operators (not including Designated Entities) acquired 32.34%, and Designated Entities acquired 13.47% of the MHz/POPs awarded through these auctions. This distribution is reflected in the figure below.

Figure 10: Distribution of MHz/POPs acquired in Wireless Spectrum Auctions from 2003 to 2013.



III. DISTRIBUTION OF SPECTRUM RESOURCES FROM SECONDARY MARKET TRANSACTIONS EVALUATED UNDER THE SPECTRUM SCREEN

The FCC granted 5,081 applications for consent to assign, transfer or lease spectrum from one private party to another between January 1, 2003 and May 31, 2013. The analysis conducted for this paper is based upon a review of license assignments/transfers and spectrum leasing arrangements pertaining to mobile broadband spectrum. This paper considers all substantial (*i.e.*, non *pro forma*) transfers/assignments consummated (closed) during the relevant period, and all spectrum leasing arrangements (*i.e.*, short-term and long-term term spectrum manager and *de facto* control leasing arrangements) that became effective[94] during that period.[95]

[94] For the "effective date" of spectrum leases, we used the FCC grant date for *de facto* transfer leases, or the "lease commencement date" provided in the lease notification for spectrum manager leases.

[95] Data reported in this paper are based upon a review of applications, notifications and consummation notices filed electronically via the FCC's Universal Licensing System. The FCC did not make available a spectrum lease application or notification form that could be submitted electronically until August 28, 2006. Leasing arrangements submitted to the FCC before this date were paper filings using FCC Form 603-T. As the data in those manually-

The FCC's review of these secondary market transactions was done on a case-by-case basis, including an analysis of the competitive impact of the proposed transaction, using the spectrum screen as discussed in Section I.B.[96] There was no spectrum aggregation cap in place that would have applied to these transactions. In addition, there generally was no restriction on the assignment, transfer, or lease of spectrum (to entities otherwise qualified to hold or lease FCC spectrum licenses), with the following three exceptions: (1) closed C and F block broadband PCS licenses were not freely assignable/transferable; the FCC's rules precluded assignment or transfer of those set-aside licenses for the first five years of the license term; (2) other spectrum held by Designated Entities was assignable/transferable, subject to certain penalties if the assignment/transfer occurred in the first five years of the license term and the purchaser was not a Designated Entity entitled to the same level of bidding credits as the seller; and (3) beginning in 2006, spectrum held by Designated Entities was subject to strict limits as to the amount of capacity that could be leased; if that amount was exceeded in the first five years of the license term, the Designated Entity could be subject to certain penalties.

Our research reflects that the FCC's case-by-case competitive analysis using the spectrum screen successfully facilitated the distribution of spectrum to both Nationwide Operators and Non-nationwide Operators. Transactions included sales to and from members of the same operator category and sales between the categories. 11.01%[97] of the MHz/POPs transferred/assigned during the relevant period[98] were conveyed from Nationwide Operators to Non-nationwide Operators, and 24.05%[99] were sold by Non-nationwide Operators to Nationwide Operators. Operators also engaged in substantial transactions within their own groups: Nationwide Operators conveyed 43.53%[100] of the MHz/POPs among themselves; Non-nationwide Operators sold 21.41%[101] within their group. These and other data are reflected in Figure 11.

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filed lease notifications/applications were not converted to a digital format that could be incorporated into database format for evaluation, the 957 of leasing arrangements submitted on paper Form 603-T from January 2003 through August 28, 2006 are not included in the analysis for this paper. Spectrum was attributed to one of the Nationwide Operators if that operator held at least a 10% ownership interest in the applicant. The figures regarding secondary market transactions in this paper do not separately identify assignments/transfers/leases to or from Designated Entities because that status is not readily apparent in all applications (*e.g.*, where a Designated Entity acquires a spectrum licenses from a non-Designated Entity, the FCC's application forms do not require the Designated Entity to identify itself as such).

[96] Short-term *de facto* transfer lease arrangements are not subject to the FCC's policies on competition. The FCC has concluded, based on the brief duration of the agreements and the desire to encourage secondary markets, that "these spectrum leasing arrangements do not raise concerns about the consolidation of control over spectrum that could have the type of unacceptable anticompetitive effects that are contrary to the public interest." *Secondary Markets Report and Order*, 18 FCC Rcd at 20676-77 ¶ 178 (citation omitted).

[97] 27,594,669,096.50 MHz/POPs.

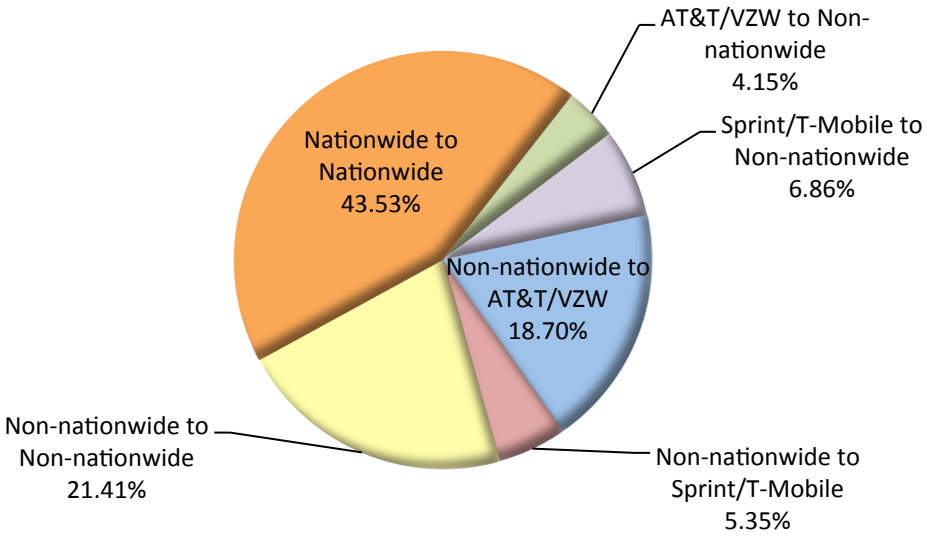
[98] 250,659,315,169.50 MHz/POPs were transferred/assigned during this period.

[99] 60,290,107,515.50 MHz/POPs.

[100] 109,120,105,386.50 MHz/POPs.

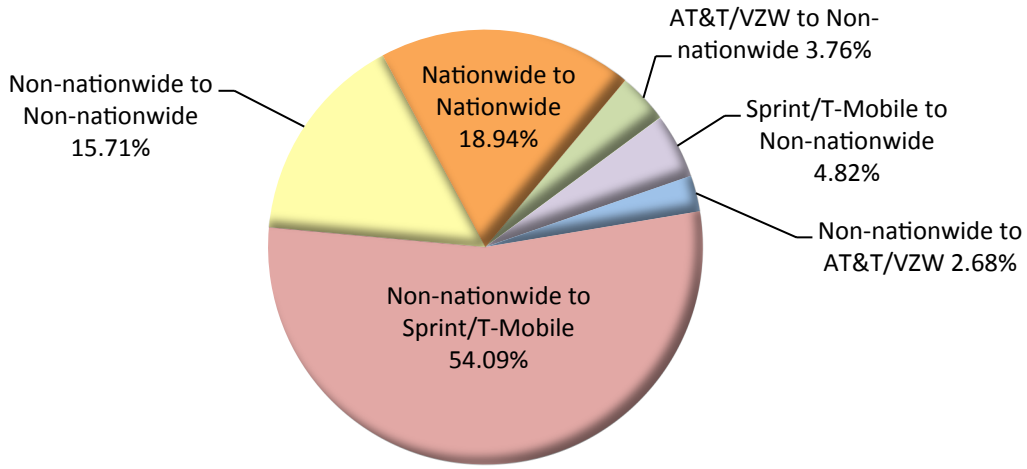
[101] 53,654,433,171.00 MHz/POPs.

Figure 11: MHz/POPs Assigned/Transferred – 2003-2013



With respect to spectrum leasing arrangements, out of a total 59,376,212,524.29 MHz/POPs leased during the relevant period, 8.58%[102] were leased from the Nationwide Operators to Non-nationwide Operators. Conversely, 56.77%[103] were leased by Non-nationwide Operators to the four Nationwide Operators collectively (almost all of which was leased to Sprint and T-Mobile). Nationwide Operators and Non-nationwide Operators also entered into leasing arrangements within their own groups: Nationwide Operators leased 18.94%[104] of the total MHz/POPs leased among themselves; Non-nationwide Operators leased 15.71%[105] of the MHz/POPs within their own group. These data are reflected in the figure below.

Figure 12: MHz/POPs Leased – 2003-2013



[102] 5,094,021,370.15 MHz/POPs.
[103] 33,709,653,801.94 MHz/POPs.
[104] 11,247,303,286.80 MHz/POPs.
[105] 9,325,234,065.40 MHz/POPs.

IV. CONCLUSION

Data from FCC spectrum auctions and secondary market transactions clearly indicate that the FCC's case-by-case review of spectrum aggregation coupled with conducting open auctions have effectively facilitated the allocation of substantial spectrum resources among a diverse array of companies, including larger and smaller operators alike, consistent with Congress' mandate in 1993:

- 45.81% of the MHz/POPs won in wireless broadband spectrum auctions over the past 10 years was won by Non-nationwide Operators; and
- 32.42% of the MHz/POPs assigned/transferred over the past 10 years, and 24.29% of the MHz POPs leased, has gone to Non-nationwide Operators.

Significantly, each of the acquisitions proceeded using an open auction eligibility approach, and without the arbitrary application of a spectrum cap. Changing these cornerstone policy frameworks in favor of a more restricted auction structure, and/or implementing spectrum caps would depart from this successful track record without ensuring a better or more efficient outcome. The bottom line is that the FCC's spectrum screen is working, and the evidence of the past decade of spectrum transactions shows that spectrum caps are not needed to enable service providers and their customers to obtain access to spectrum resources.